# The key role of shared participation in changing occupational self-efficacy through stress management courses

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# The key role of shared participation in changing occupational self-efficacy through stress management courses

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Abstract

This study is the first that longitudinally examined change in occupational self-efficacy (OSE) through individual and shared participation in occupational stress management courses (SMC). Applying the framework of social cognitive theory (Bandura, 1986), we assumed that participation in SMC facilitates occupational self-efficacy perceptions. We further assumed that the psychosocial environment promotes change in OSE through high shared participation (reach) in SMC within work groups. Comparing participants and non-participants, we conducted growth analyses with three waves of data nested in *N*=545 employees further nested in 97 work groups. The results showed that individual participation in SMC alone was insufficient to enhance OSE, a combination of individual and high shared participation being needed to significantly enhance OSE perceptions over a period of two years. The results are discussed with reference to specificity issues and the role of the psychosocial environment by applying social identity theory and the notion of shared mental models. We conclude by recommending SMC as a feasible intervention to enhance OSE in heterogeneous occupational contexts – if a majority of work group members can be involved.

*Keywords*: Occupational self-efficacy, stress management intervention, psychosocial environment, shared participation, growth analysis, process evaluation, reach

Practitioner Points

- The study recommends stress management courses for enhancing occupational self-efficacy as a short and relatively low-cost intervention that is feasible to implement in various occupational and organizational contexts.
- The key point here is that a majority of work group members are encouraged to engage in courses to obtain the beneficial effects on change in occupational self-efficacy.

# The key role of shared participation in changing occupational self-efficacy through stress management courses

Occupational self-efficacy is an important personal resource in the prevention of job stress and stress management. It is positively associated with (1) personality constructs, such as general self-efficacy, self-esteem, internal control beliefs, (2) job resources, such as supportive supervisor behaviour, and (3) organizational outcomes, such as job satisfaction and commitment (Schyns & von Collani, 2002). In consideration of its significance, enhancing occupational self-efficacy could be a beneficial means in preventing negative effects of exceeding job demands, such as prolonged stress, burnout and associated adverse health effects (Bresó, Schaufeli, & Salanova, 2011; Salanova, Grau, & Martínez, 2006). In the context of occupational health intervention studies, occupational self-efficacy has been recommended not only as a personal resource that may buffer the negative effects of job demands, but also as an evaluation criterion for training programmes (Rigotti, Schyns, & Mohr, 2008). Using OSE as an outcome measure of occupational health interventions such as stress management courses requires an understanding of its natural variability and susceptibility to targeted change. To our best knowledge, no previous studies have investigated these two issues.

Thus, this study aims to examine the variability of occupational self-efficacy by examining the effects of individual and shared participation in stress management courses on change in occupational self-efficacy in a longitudinal study. Bandura's social cognitive theory (Bandura, 1986, 2001) provides the framework for explaining how occupational self-efficacy can be developed and enhanced through individual and shared participation in stress management courses. Following this framework, we assume that individual-level stress management courses have the potential to improve occupational self-efficacy by providing opportunities to experience enactive mastery, vicarious experience, verbal persuasion and

positive affective states, together constituting the four sources of self-efficacy (cf. Bandura, 1977, 1997). Unlike most of the evaluation research on individual-level intervention approaches, we take a new approach and assume and integrate possible effects of the psychosocial environment of the work group into the evaluation design as an implementation process variable (cf. Karanika-Murray & Biron, 2013). As, first, self-efficacy perceptions develop in interaction of the person with the environment, and second, since the stress management courses implemented in the context of the present study do not take place in a laboratory setting, but in real organizational contexts, we consider not only the participation of individual employees as one way of enhancing occupational self-efficacy, but also the influence of the psychosocial environment in terms of shared participation within work groups as a second way of developing and promoting efficacy perceptions.

**Occupational Self-Efficacy**

Self-efficacy is a core construct of Bandura's social cognitive theory (SCT; Bandura, 1977, 1986) and is defined as the belief in one's ability to successfully execute the behaviour required to produce a specific outcome, in other words, to successfully fulfil a task (Bandura, 1977, 1997). "Efficacy expectations determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences" (Bandura, 1977, p. 194). Studies on the relationship between self-efficacy and health outcomes support the health-protecting and promoting effect of self-efficacy (O'Leary, 1992). In an occupational context, studies showed that employees with high general self-efficacy act more proactively in stressful situations (Jex, Bliese, Buzzell, & Primeau, 2001), experience less psychological and physical strain and higher job satisfaction (Jex & Bliese, 1999) compared to those with lower levels of self-efficacy.

Bandura noted the importance of adapting the assessment of self-efficacy to activity domains, or even more specifically, to tasks, as a prerequisite to achieve explanatory and

predictive power (cf. Bandura, 1977, 1997). *Occupational self-efficacy* (OSE) is a domain-specific form of self-efficacy. Consequently, OSE is defined as "the competence that a person feels concerning the ability to successfully fulfill the tasks involved in his or her job" (Rigotti, et al., 2008, p. 239). Although very narrow, task-specific measures of self-efficacy, such as the belief in one's ability to successfully write and publish an academic paper, would offer the highest explanatory and predictive power because of its high level of specificity, its use is restricted on the same time to a very narrow population of, in this case, the occupational group of academics who are involved in publishing activities. In contrast, OSE is of medium specificity and is thus at the same time specific to the occupational context, instead of assessing general self-efficacy, and – compared to narrower task-specific measures of self-efficacy – OSE enables comparisons of different jobs, professions, organizations and business sectors (Schyns & von Collani, 2002; see also Bandura, 1997).

**Change of OSE**

Self-efficacy is a dynamic construct, i.e. perceptions of efficacy can change over time and can be modified by interventions (Bandura, 1982; Gist & Mitchell, 1992). According to Bandura's SCT, self-efficacy is based on four major sources of information (Bandura, 1977, 1997). The first and most important of these is the experience of *personal mastery*, which in the case of the domain-specific OSE means one's own experience of successfully fulfilling assignments. The second source of self-efficacy is *vicarious experiences*. When others who are similar to oneself (e.g. colleagues) successfully master challenging tasks, they act as social models and through social comparison processes one can draw conclusions about one's own ability to do likewise. A third source of self-efficacy is found in *symbolic experience* e.g. verbal persuasion: Others, such as team members or supervisors, reinforce one's own ability to successfully fulfil challenging tasks. And the fourth source of self-efficacy lies in *emotional arousal*, when people draw information from their own physiological and affective

states of well-being or arousal – in the case of OSE – about their ability to successfully fulfil challenging tasks. The positive emotional state accompanying work engagement, for example, has been identified as a source of enhancing beliefs in one's own efficacy (Llorens, Schaufeli, Bakker, & Salanova, 2007).

According to Bandura, intervening on the four sources of self-efficacy will be the basis of an interventions' success (Bandura, 1977, 1997). Indeed, several empirical studies from diverse fields such as phobia therapy (Bandura, 1982), academic education (Bartsch, Case, & Meerman, 2012), clinical training of healthcare students (Nørgaard et al., 2013), and courses for trainee sales representatives (Schwoerer, May, Hollensbe, & Mencl, 2005) support this assumption. In research within occupational health psychology, general self-efficacy and its task or domain-specific conceptualizations are usually studied as mediator or moderator variables (e.g. Nielsen, Yarker, Randall, & Munir, 2009; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). However, few studies have examined self-efficacy as a criterion variable, e.g. regarding its variability in the context of occupational health intervention studies. Shimazu and colleagues investigated the effects of a web-based psycho-education programme, which aimed to increase knowledge of stress, self-efficacy and the use of problem-solving behaviour over five weeks and found no significant change in general self-efficacy in the overall sample. Only the subgroup of younger workers experienced a small increase in general self-efficacy (Shimazu, Kawakami, Irimajiri, Sakamoto, & Amano, 2005). As regards interventions aiming at more specific forms of self-efficacy, Bragard and colleagues conducted an intervention study on an intensive (40 hour) training course in communication skills and stress management among medical residents in oncology: it showed large changes after five months in the task-specific self-efficacy to communicate and manage stress in interviews (Bragard, Etienne, Merckaert, Libert, & Razavi, 2010). Hahn and colleagues further examined the effects of an intensive two-day training programme in job stress

recovery, which yielded medium to large effects on change in recovery-related self-efficacy after five weeks (Hahn, Binnewies, Sonnentag, & Mojza, 2011). We know of only one study that examined change in professional self-efficacy – a conceptualization that is of comparable degree of specificity to OSE. The study examined the effectiveness of a team redesign intervention at organizational level, and found a small positive effect on change in professional self-efficacy after six months (Cifre, Salanova, & Rodriguez-Sanchez, 2011). However, this result has to be interpreted with caution concerning its generalisation, as the intervention group comprised only one team with nine employees. As regards occupational interventions on an individual level, however, to our best knowledge no study has examined change in OSE. To summarize, compared to general and task-specific forms of self-efficacy, only little is known about how variable OSE is and how it can be enhanced.

We follow a similar approach as the reviewed studies and hypothesize that a possible way to enhancing OSE is to participate in individual-level occupational stress management courses. Stress management courses, such as the one to be investigated in this study, usually involve knowledge transfer and training about stress, stress appraisal, coping techniques, resources and their activation, and aim in general terms to reduce and prevent stress while enhancing experiences of mastery. Thus, although the term “stress management” might imply associations predominantly with the negative, health-impairing side of work, usually a more comprehensive approach is pursued within such courses, which includes a balanced consideration of both negative aspects, such as job demands, and positive aspects, such as personal and job resources. Against this background, we assume the four sources of self-efficacy to be affected by participation in the course resulting in enhancing OSE over time (cf. Bandura, 1977; Cifre, et al., 2011). Table 1 presents an overview of the main elements of the stress management course underlying the present study and the mechanisms, which address the four sources of OSE, respectively.

[Insert Table 1 about here]

In sum, we assume that participation in individual-level stress management courses improves OSE by providing opportunities to experience enactive mastery, vicarious experience, verbal persuasion and physiological states of well-being. We consequently formulate the following hypothesis:

*Hypothesis 1:* Compared to non-participants, participants in stress management courses experience a positive change in OSE.

**Psychosocial Influences of the Proximate Work Group Environment: Shared Participation in Stress Management Courses**

Besides the participation of an individual employee per se in stress management interventions, we identify another way of enhancing OSE, namely through influences of the psychosocial work group environment. Self-efficacy develops out of interactions between the individual and the environment; the quality of this interaction is thus of key importance. This includes providing opportunities for engaging in efficacious actions, e.g. by a stimulating, challenging and responding social environment (Gecas, 1989). In addition to equipping the individual employee with new coping strategies and so on, building and ensuring a responsive social environment that is sensitive to the matters of job stress and its management is supposed to be a further means of reaching the goal of developing OSE (see Füllemann, 2014). When consulting literature on effectiveness studies of stress management interventions, however, most of these focus only on individual participation and its effects, thereby ignoring environmental influences on the level of the work group (e.g. Johns, 2006). In reality, however, employees are nested within a psychosocial work group environment, which influences daily social and factual processes at work (Bauer & Jenny, 2012) and interacts with the individual psychological characteristics of employees (Egan, 2013). In the literature on occupational health intervention research, thus, there is a growing acknowledgment of the

importance of the context and process factors that might influence the implementation and success of an intervention (Biron, Karanika-Murray, & Cooper, 2012). As Karanika-Murray and Biron (2013) suggest, "shared or collective experiences provide a type of context and can be as influential as individual's personal experiences" (p. 251).

We assume that the proximate psychosocial environment at work, i.e. colleagues and supervisors, plays an important role in developing OSE similarly through feeding the sources of self-efficacy (cf. Bandura, 1977; Cifre, et al., 2011). In more detail, we propose *direct influences* of the psychosocial environment on a person's OSE through (1) vicarious experience of mastery, and through (2) verbal persuasion of one's own ability to master a challenging task or stressful situation. As an explanatory mechanism, we assume that members of a work group reciprocally reinforce each other not only during the course, but also, even more importantly, after the course is finished, back in daily work processes. In our view, a key precondition of such a psychosocial environment, that is sensitive to the matters of job stress and supportive regarding its management, is the reach of participation in stress management courses within work groups (Glasgow, Klesges, Dzewaltowski, Estabrooks, & Vogt, 2006; Murta, Sanderson, & Oldenburg, 2007). We use the term "shared participation" with reference to the proportion of members of a work group participating in the intervention. It makes a difference to be the only person within a work group who is interested in stress management issues, as opposed to a majority of work group members participating in stress management courses and therefore engaging in related thoughts, dialog and activities. A high level of shared participation of a work group might facilitate reciprocal reinforcement within work groups already during the course, as participants previously know each other. But also after the course is finished, it may be easier to apply the information and measures learned there, and train and maintain these, if such attempts are reinforced by other members of the work group who went through the same learning experience (cf. Bandura, 2000). Furthermore,

we assume a more *indirect effect* of the psychosocial environment on OSE through social support in stressful and critical situations, hence increasing the chance of (3) experiencing mastery. This reasoning is supported by the explanatory framework of the theory of social identity (Haslam, Jetten, Postmes, & Haslam, 2009). Social identity theory assumes that people define themselves in terms of group membership (social identity) (Haslam, et al., 2009). Members of a group share certain characteristics, such as being part of an intervention group, and consequently form perceptions of in- and out-groups (Nielsen, 2013). Shared social identity in a group "serves as a basis for the receipt of effective support from ingroup members" (Haslam, et al., 2009, p. 11). Consequently, feelings of being part of an in-group "may create a sense of 'we are in this together', thereby increasing social support in the intervention group" (Nielsen, 2013, p. 8). These mechanisms of shared social identity and associated support can be applied to shared participation in individual-level stress management courses. As participation reach within work groups increases, the in-group of employees involved in the intervention increases and ultimately represents the majority within a work group. Thus, the sense of "we are in this together" associated with a shared social identity regarding job stress and its management can evolve and mechanisms such as increased social support can enhance the effects of the intervention.

We thus hypothesize that an additional possible way to enhance OSE lies in a high level of shared participation, i.e. attaining a high reach of participation in stress management courses within work groups. In general terms, we assume that all four sources of information on self-efficacy would gain from a high level of shared participation in stress management courses. Thus, we formulate the following interaction hypothesis:

*Hypothesis 2:* Shared participation (i.e. a high reach) in stress management courses within work groups interacts with individual participation in such a way that individual participation in combination with a high level of shared participation enhances OSE the most.

Finally, we will control for pre-intervention levels of OSE, as it is important to consider baseline levels in the process of intervention-induced change (Flaxman & Bond, 2010; Nørgaard, et al., 2013; Semmer, 2006).

## Method

### Study design and data collection

The study employed longitudinal data collected in the context of a large stress management intervention project (see acknowledgments) implemented in eight medium- and large-sized companies in Switzerland from diverse sectors (four industrial production companies, one food processing company, one public administration service, and two hospitals). For an in-depth description of the overall project architecture and the elements of its underlying multilevel stress management intervention, see Jenny et al. (2014). A baseline employee survey was conducted in 2008, followed by an intermediate survey in 2009 and a follow-up survey in 2010. The survey results were immediately and automatically fed back to individual participants in the form of a "traffic-light" display and detailed percentile rankings with respect to the benchmark values, including tips on the highlighted topic. Response rates to the questionnaires were 71% ($N_{t1}$ = 3,532), 63%, ($N_{t2}$ = 3,193) and 50% ($N_{t3}$ = 2,496) at the baseline, intermediate, and follow-up measurements, respectively. The resulting panel sample with survey respondents at all three measurement points consisted of $N$ = 1,286 employees, the panel sample with employees who responded to the survey at least at the baseline and follow-up measurements consisted of $N$ = 1,530. For the purpose of the current study, we excluded all employees with supervisory functions, as they were not targeted by the stress management courses. Further, we excluded employees working in structurally unstable work groups, i.e. not existing consistently at all three points in time, as well as those employees who changed to another work group during the study period. The final panel study sample of $N$ = 545 employees is described in the section below.

We applied an adapted study design by using the measurement of intervention exposure to assign employees a posteriori to intervention and control groups. This approach allows quantitative outcome evaluations to be made where controlled quasi-experimentation is impossible, as in full-scale interventions in organizations (cf. Randall, Griffiths, & Cox, 2005).

**Participants**

The final panel study sample consisted of $N = 545$ employees without supervisory functions who filled out the questionnaires at least at the baseline and follow-up points. These employees were nested in 97 work groups with an average size over the three time points of $M = 25.23$ ($SD = 19.87$), range [3.5 to 119.5]. Sixty-one percent of the sample were male, the mean age of the respondents was 38 years ($SD = 10.4$), and they had on average worked five years in their current job at baseline. About 80% were employed full-time.

A total of 196 employees (36%) of the panel study sample participated in individual-level stress management courses (intervention group), while 287 (53%) did not participate (control group). We had no reliable information about the participation in courses of 62 employees in the sample. We therefore excluded these employees from the respective analyses.

In order to assess the effects of potential subject attrition, we followed the recommended four-step procedure of Goodman and Blum (1996). First, we assessed the presence of non-random sampling by conducting a multiple logistic regression. The results indicate that sampling was non-random with respect to baseline levels of OSE, $b = .21$, $SE = .07$, $p < .01$, $Exp(b) = 1.23$, and gender, $b = .52$, $SE = .11$, $p < .001$, $Exp(b) = 1.68$. Those employees with initially lower OSE and females had a higher probability of staying in the panel sample, i.e. were less likely to drop out. Second, t-tests showed significantly different mean levels of education between the panel and dropout samples, $t(1850) = 5.03$, $p < .001$, $d$

= 0.25, 95% CI [0.17, 0.39]. Employees remaining in the panel had a higher level of education. Third, as regards variance differences in the study variables, OSE, age and job tenure showed significantly less variance in the panel sample than the whole sample at baseline, $z = -2.31$, $z = -3.67$, $z = -2.51$, all $p < .05$, respectively. Fourth, however, these differences in means and variances in some of the study variables do not affect the pattern of their relationships with OSE at baseline, as tested by multiple regression analyses. To summarize, non-random sampling affected the means and variances of some of the study variables, but not their underlying relationships.

**Stress Management Courses**

Between baseline and t3, individual-level stress management courses (SMC) were conducted with employees without supervisory functions. The great majority of SMCs were implemented between t1 and t2 and within a time span of three months, i.e. that t3 essentially serves as a follow-up measurement. However, there were a few departments where participation varied slightly across the time span and not all the SMCs were implemented before t2 measurement. This inconvenience is mainly due to practical and operative reasons, such as the organizations' need to keep business running and at the same time their request to enable all employees to participate. This lead to several dates of courses and a shorter or longer period of implementation of SMCs. The courses were provided by experienced external consultants following a standardized procedure specified by a manual; they took one day plus a half-day refresher approximately six months later. SMC aimed at broadening the competencies of employees with respect to the prevention of stress and coping, strengthening personal resources, and enhancing health and well-being. SMC participants thus obtained basic knowledge and training on stress, stress appraisal, resources, coping strategies and cognitive restructuring (see Table 1). Based on the fed back results of the baseline employee survey, participants worked on individual and unit-specific stress issues and individual coping

strategies, analysed personal resources and worked on ways to strengthen them, built up motivation and readiness for change, and planned their transfer into daily work life. Educational and action parts alternated in the course programme. Consultants received scripts for the implementation of the courses but were free to adapt the programme according to situational conditions and needs of the participants. However, the adaptations had to be in line with the overall goals and contents of the course. The courses were based on scientific evidence as well as practitioner manuals (e.g. Kaluza, 2011) and represent a secondary preventive attempt at the individual/ job interface level (cf. Murphy & Sauter, 2004). The number of participants was restricted to a maximum of 20 employees per course. Participants took part in the intervention voluntarily during working hours, although participation had a mandatory character in some organizational units – especially in those with high job demands.

**Measures**

*Occupational self-efficacy*. We measured occupational self-efficacy on a six-item scale developed by Rigotti and colleagues (2008). A sample item is: “When I am confronted with a problem in my job, I can usually find several solutions”. Responses were scored on a 6-point rating scale ranging from 1 = *not at all true* to 6 = *completely true*. Scale reliabilities were satisfactory with Cronbach s ±=.89/.89/.90 at baseline, intermediate, and follow-up measurements, respectively.

*Individual participation in SMC*. We measured individual participation in SMC as an individual-level variable using information gained from the self-reporting measures included in the intermediate and follow-up employee surveys, as well as from course evaluation sheets filled out immediately at the end of the courses. Because attendance records were anonymous and indicated only the number of participants per SMC but not their personal identity, we had to rely on self-report data about participation as indicated in the surveys. Employees were asked to indicate whether they participated in SMC at both the intermediate and follow-up

measurements. We had no reliable self-reporting data on participation in SMC for those employees who did participate in the follow-up but not in the intermediate survey. Thus, we additionally relied on data gained from determining whether there existed a course evaluation sheet from a respective employee. If the course evaluation form was completed, we concluded that the respective employee did participate in SMC. Individual participation in SMC is dichotomous, scoring 0 = *not participating in SMC* and 1 = *participating in SMC*.

*Shared participation in SMC*. Shared participation as a work group-level variable was measured as the reach of individual participation in SMC within work groups. Because attendance records of SMC were anonymous and work group members did not participate all in the same SMC, objective participation numbers were not available at the level of the work groups. Thus, we used information from the cross-sectional subsamples of the intermediate and the follow-up questionnaires to gain the best possible approximation to objective participation rates within work groups. To ensure reliability, we excluded work groups with a very low response rate to the questionnaire measurements (< 30%) and those with fewer than two respondents. Shared participation in SMC within work groups ranged from 0% to 100%. As the distribution of the scale was not normal but had two maximums at the lower and the higher endpoints, we further categorized shared participation within work groups for the subgroup analyses in a dichotomous variable, scoring 0 = *less than 50% within work group participated in SMCs* and 1 = *50% and more within work group participated in SMCs*.

*Covariates*. We assessed the age, gender, highest educational degree and job tenure as control variables on Level 2, as employees may differ in their self-efficacy along these socio-demographic characteristics (cf. Rigotti, et al., 2008), as well as work group size on Level 3.

**Data Analyses**

For correlations of study variables, we calculated Pearson's correlation coefficient, Spearman's rho, and the phi coefficient for two dichotomous variables. To investigate our

hypotheses, we applied multilevel growth modelling, which takes into account non-independence and effects on different levels of analysis. For the calculations, we used the nlme package in the open-source statistical environment R (Pinheiro, Bates, DebRoy, Sarkar, & the R Development Core Team, 2011; R Development Core Team, 2011). Our analysis strategy followed the recommendations of Bliese and Ployhart (2002).

In order to avoid problems with collinearity in the model specifications when regressing OSE on individual and shared participation in SMC at a time, we conducted sub-group growth analyses instead. Thus, we split the sample into two subsamples according to the level of shared participation within work groups. The subsample with low shared participation consisted of $N = 328$ employees working in 55 work groups where less than half of the group participated in SMC. Whereas the subsample with high shared participation consisted of $N = 217$ employees working in 42 work groups, where at least half of the group members participated. The t-tests showed no significantly different means in pre-intervention levels of OSE between the subsamples of low and high shared participation, $t(533) = –1.34$, $p = .18$, $d = -0.12$, 95% CI [-0.23, 0.04]. Furthermore, subsamples did not differ significantly in terms of mean age, $t(542) = –1.60$, $p = .11$, $d = -0.14$, 95% CI [-3.24, 0.33], job tenure, $t(532) = 0.06$, $p = .95$, $d = 0.01$, 95% CI [-12.55, 13.32] and work group size, $t(95) = –1.01$, $p = .31$, $d = -0.21$, 95% CI [-12.21, 3.96]. There were slightly more male (65% vs. 59%) and more full-time employees (83% vs. 77%) in the subsample with high shared participation compared to the subsample with low shared participation.

## Results

Means, standard deviations, scale reliabilities, and correlations of the study variables on the individual level (Level 2) are shown in Table 2. Concerning the study variables on the work group level (Level 3), the average work group size was $M = 25.23$ ($SD = 19.87$) and

average level of shared participation in SMC was $M = 45.35\%$ ($SD = 35.28\%$). Work group size and level of shared participation in SMC correlated with $r = .08$ (n.s.).

[Insert Table 2 about here]

We have three measurement time points of OSE (Level 1) nested within employees (Level 2), who were in turn nested in work groups (Level 3). Thus, we assumed that being a certain employee and/ or belonging to a certain work group influences OSE. In line with this assumption, within-employee measurements of OSE were non-independent, ICC(1) = .63, $F(543, 983) = 5.77$, $p < .001$, indicating that 63 percent of the OSE variance depends on being a certain employee. Employees were distinguishable with regard to their mean self-efficacy levels, ICC(2) = .83. Moreover, within-group measurements were also non-independent, ICC(1) = .12, $F(96, 1430) = 3.23$, $p < .001$, indicating that 12 percent of the OSE variance depends on belonging to a certain work group. Work groups were similarly distinguishable with regard to their mean levels of self-efficacy, ICC(2) = .69.

In line with the recommendations of Bliese and Ployhart (2002), we then determined the fixed function for time as being either linear or quadratic in nature. We conducted a regression analysis on self-efficacy across time to detect the type of relationship between time and the outcome of self-efficacy. We found neither a significant linear effect, $t(1527) = 1.34$, $p = .182$, nor a significant quadratic effect, $t(1527) = -0.42$, $p = .673$, between time and self-efficacy. However, in view of the difference in the quantities of the two t-values, the subsequent analyses were preceded by a linear model.

**Effect of Individual Participation in SMC on Change in OSE**

We firstly hypothesized a positive effect of individual participation in SMC on change in OSE. To test our assumption, we built our multilevel growth model in a stepwise procedure. First, we tested whether an ordinary least squares regression model with a fixed intercept would fit the data better than our assumed random coefficient model by regressing OSE on a

constant. In a second step, we allowed the intercept to vary between groups, i.e. employees on Level 2 and work groups on Level 3 were allowed to vary in terms of their initial levels of self-efficacy, respectively. This second model (random-intercept model) fitted to the data significantly better than the model with a fixed intercept, $\chi^2_{diff(2)} = 567.65$, $p < .001$. In a third step, we examined a model that additionally allowed varying slopes (random-intercept-and-slopes model). This third model did not fit the data significantly better than the model with fixed slopes, $\chi^2_{diff(4)} = 2.12$, $p = .714$. However, as the fits of the random-intercept and the random-intercept-and-slopes models are about equivalent, we will use the latter model because it enables the examination of the hypothesized cross-level interaction effects.

As time appears as a Level 1 variable in our growth model, we further tested for autocorrelation and heteroscedasticity in our data (cf. Bliese & Ployhart, 2002). Thus, we controlled for autocorrelation between measurement time points in a fourth model. However, this model did not fit significantly better than the model not controlling for autocorrelation, $\chi^2_{diff(1)} = 0.83$, $p = .361$. Likewise, the fifth model, which controlled for heteroscedasticity between points of measurement, did not fit the data better than the fourth model, $\chi^2_{diff(1)} = 0.09$, $p = .757$. The subsequent analyses are consequently based on model three, assuming random slopes and intercepts.

In a next step, we tried to explain the intercept variation by adding the control variables of gender, age, education level, and job tenure on Level 2 and work group size on Level 3 to the model. Among these control variables, only age significantly predicted variance of the intercept in OSE (see Step 1 in Table 3). Older employees have a higher OSE at baseline. All non-significant covariates were omitted from the model for the subsequent analyses. In order to examine the influence of individual participation in SMC on change in OSE, in a next step we added individual participation and its interaction with time to the

model. Step 2 in Table 3 indicates that individual participation in SMC does not significantly predict change in OSE over time. Thus, Hypothesis 1 was not supported.

[Insert Table 3 about here]

**Interaction Effect of Shared and Individual Participation in SMC on Change in OSE**

Furthermore, we hypothesized an interaction effect of individual and shared participation in SMC on change in OSE. Growth analysis with the subsample of low shared participation showed that besides age, the control variable of educational level also significantly explained variance in the intercept of OSE (see Table 4 Step 1). Hence, older employees and employees with a higher level of education have higher initial levels of OSE. All other non-significant covariates were omitted from the model for the subsequent analyses. In a next step, we included individual participation in SMC and its interaction with time in the model. As Step 2 in Table 4 indicates, individual participation does not predict change in OSE over time in the subsample with low shared participation.

[Insert Table 4 about here]

Growth analysis of the subsample of high shared participation indicated that no control variable significantly explained variance in the intercept of OSE. For the sake of comparability between the two subsamples, however, the control variables education and age were kept in the model. When we included individual participation in SMC and its interaction with time in the next step, we found a significant effect of participation (one-sided), see Step 2 in Table 4. Figure 1 shows the interaction of individual participation in SMC contrasted with no participation in OSE change over time in the subsample with low and high shared participation on the left and right side respectively. Hence, in the subsample of high shared participation, individual participation in SMC seems to have a positive effect on OSE change. Thus, Hypothesis 2 was supported.

[Insert Figure 1 about here]

In addition to the graphic illustration in Figure 1, we analysed the simple slopes for the conditional regression of OSE on time for participants and non-participants in both subsamples of low and high shared participation, respectively. The results of simple slope tests (Preacher, Curran, & Bauer, 2006) indicate that only participants of SMC in the high shared participation group showed a significant increase of OSE over time ($b = 0.06$, $SE_b = .03$, $z = 2.05$, $p < .05$). The other three groups did not show a significant change in OSE over time: for participants in SMC in the low shared participation group, $b = 0.02$, $SE_b = .05$, $z = 0.36$, $p = .72$; for non-participants in the high shared participation group, $b = -0.04$, $SE_b = .05$, $z = -0.75$, $p = .45$; and for non-participants in the low shared participation group, $b = 0.03$, $SE_b = .02$, $z = 1.44$, $p = .15$. These findings further supported Hypothesis 2.

We further investigated whether pre-intervention levels of OSE interact with the supposed effects of individual and shared participation in SMC. In the subsample with low shared participation, we found no interaction effect of pre-intervention levels of OSE with participation in stress management courses and change in OSE, $b = -0.06$, $t(548) = -0.58$, $p = .56$. However, we found a significant three-way interaction in the subsample with high shared participation, $b = -0.22$, $t(365) = -3.84$, $p < .001$. Participating employees with low pre-intervention levels of OSE benefited particularly from courses on stress management. Those participating employees with high pre-intervention levels of OSE maintained these high levels over time.

## Discussion

This longitudinal study examined change in OSE induced by individual and shared participation in occupational SMC. The results of growth analyses showed that individual participation by employees in SMC alone did not suffice to affect change in OSE (*Hypothesis 1*). However, individual participation in combination with a high level of shared participation in SMC within work groups had a positive effect on OSE change over a period of two years

(*Hypothesis 2*). Thus, it seems that both factors are required, namely participation by individual employees who are also embedded in a work group environment where a majority of work group members are engaged in SMCs.

The study addressed two gaps in the literature on occupational health psychology. In the first place, our study is the first to examine the variability of the domain-specific conceptualization of OSE by way of stress management interventions. Previous studies had only investigated induced change in related concepts of self-efficacy, such as either very narrow task-specific forms of self-efficacy (e.g. Bragard, et al., 2010) or in general self-efficacy (Shimazu, et al., 2005). The only study we found that examined change in a domain-specific measure of self-efficacy – comparable to OSE – is that of Cifre and colleagues (2011). Their study showed small positive changes in professional self-efficacy after six months affected by an organizational-level team redesign intervention. Thus, our study is the first to show evidence for how OSE can be enhanced through individual-level stress management interventions in contrast to organizational-level interventions. It is also the first to investigate the effects of shared participation in interaction with individual participation in a stress management intervention on change in OSE. Conventionally, the reach of an intervention is – if at all – reported only when describing the intervention context and the sample as anecdotal data (cf. Glasgow, Bull, Gillette, Klesges, & Dzewaltowski, 2002), but not as an explanatory variable included in the actual evaluation study design, referring to influences from the psychosocial environment.

How can we explain why individual participation alone, i.e. without considering the group-level aspect of shared participation regarding whether a minority or a majority of the group members participated in SMC, was not sufficient to enhance OSE (Hypothesis 1)? We can identify two main issues that distinguish our study from earlier studies, which reported major changes of self-efficacy by way of individual-level interventions investigating solely

individual participation without considering the possible effects of the psychosocial environment. The first issue concerns the *specificity* of the self-efficacy concept under consideration (cf. Bandura, 1977). The more specific the forms of self-efficacy aimed at in interventions, the narrower the course contents and the more similar the group of course participants, for example, in terms of previous experience with the topic. This is illustrated by intervention studies aiming at enhancing self-efficacy among students (Bartsch, et al., 2012; Nørgaard, et al., 2013) or trainee sales representatives (Schwoerer, et al., 2005). In these cases, the participants had limited or non-existent past experience of the tasks to be learned, such as students who newly attend a course in statistics, and the interventions could be assumed to affect major changes in the very narrow task-specific measures of self-efficacy, such as statistics self-efficacy (Bartsch, et al., 2012). However, for the domain-specific form of OSE targeted in our study, the course participants were ordinary and skilled employees who faced more or less similar challenges in their daily work life before and after the course associated with an unspecific and broad variety of tasks and activities. Thus, these changes in OSE were not expected to be of similar magnitude to those covered by studies examining task-specific forms of self-efficacy, which refer to a narrower spectrum of tasks. A second issue is also related to the specificity of self-efficacy but refers essentially to the role of the *social context* – yet independent from considerations of the degree of shared participation. Experiences of efficacy can depend to a greater or lesser extent on the social context and its influences. Self-efficacy training courses, which aim to instil behaviours that can be executed more or less single-handedly and are thus largely under the control of each single participant are more likely to be successfully implemented than if context influences are strong. The study of Bragard et al. (2010) among medical residents aiming to improve their self-efficacy in communicating and managing stress in interviews with cancer patients represents such an attempt. Interviewing patients represents an isolated single task among a range of tasks

involved in a medical residents' job, which tend to be under the full control of the participant – here the medical resident. However, in the case of OSE, which involves, according to its domain-specific nature, a broad range of tasks and activities in daily work life and where employees are embedded in organizational structures and usually depend on the actions of their co-workers and supervisors to some extent, the environmental component consequently plays a stronger role in developing self-efficacy perceptions in the interplay between the individual and the environment (Gecas, 1989). This suggests another possible explanation as to why individual participation in SMC alone, i.e. without considering the social context, was insufficient to enhance the domain-specific OSE.

Indeed, our results demonstrate that the work group environment matters – even though occupational SMCs represent an individual-level intervention approach in which the team context is not usually considered. The finding that a considerable amount of 12 percent of the OSE variance depends on work group membership is remarkable. It supports our approach of considering group-level variables in OSE change studies. We identify two mechanisms by which the psychosocial work group environment can promote perceptions of OSE through shared participation in SMC and thus can enhance OSE over time. The first explanatory mechanism is identified in the theory of *social identity*. As stated in the introduction, we assumed that the formation of an in-group of intervention-involved employees and an associated shared social identity could evolve within work groups with increasing shared participation. When the majority of work group members are involved in the intervention, the sense of "we are in this together", in other words, a shared social identity regarding job stress and its management can evolve more easily and facilitate acts of reciprocal reinforcement and social support. The second mechanism explaining how the psychosocial work group environment can enhance experiences of occupational efficacy refers to the notion of *shared mental models* (Mathieu, Goodwin, Heffner, Salas, & Cannon-

Bowers, 2000). In work groups with high levels of shared participation, where a majority have attended courses on stress management, most work group members are aware of and know the basic facts about stress, coping and resource activation after having participated in SMC. This circumstance may help to raise a pattern of shared awareness of the topic of stress and stress management within work groups, and among other things promotes social support in stressful situations. Experiences of mastery are consequently facilitated in such a sensitive psychosocial environment.

The combination of individual and shared participation in SMC yielded a small but significant positive change in OSE over a period of two years. The implemented SMC represents a relatively short and thus feasible intervention for application in a broad range of organizations – but with limited effects. As Bandura observes, the methods that have proven to be most effective in enhancing beliefs of efficacy are those which require a greater investment of time and effort (Bandura, 2000). We consequently assume that more intensive programmes might succeed in achieving greater OSE change. However, the implementation of stress management courses within whole organizations also involves arguments of costs and feasibility.

We additionally considered the role of pre-intervention levels of OSE on the relationship between individual and shared participation in SMC and change in OSE. Our results are in line with previous intervention studies targeted at enhancing self-efficacy, e.g. about inter-professional clinical training of healthcare students, as the training course was also found to be particularly effective in enhancing self-efficacy among those students who initially recorded low self-efficacy scores (Nørgaard, et al., 2013).

**Study Limitations and Directions for Future Research**

Our findings have to be interpreted in the light of the characteristics of the panel sample and can therefore be generalised only to a limited extent in several respects. First, our

study sample included only work groups that existed over the full study period of two years. This can limit the generalization of our results to essentially stable work group structures. However, the research goals and design of the study necessitated this restriction, otherwise the shared participation rates in SMC would have been meaningless. Moreover, we detected a selective dropout in the study sample that should be considered in generalizing the findings. Those employees who stayed in the panel were more likely to be female, had higher levels of education and lower pre-intervention levels of OSE. We do not consider the initial OSE levels to be a limitation, as especially those employees with room for improvement stayed in the panel, so that our findings do not demonstrate a healthy worker effect (McMichael, 1976).

Another restriction of the study design is that we had no information about whether employees from one work group attended the same SMC together or attended different courses separately. The study design aimed to have entire work groups in one course. However, the restrictions of keeping up daily work processes whilst SMC were delivered made it conceivable that work groups did not participate fully in the courses. Hence, future studies should investigate whether it makes a difference to the effect size on OSE change if work groups attend SMC jointly or separately.

Our findings support the inclusion of measures of the psychosocial environment in the design of intervention studies, and not only as an anecdotal side remark in describing the context of the study. We consequently advise our fellow researchers to carry on and account for influences of the psychosocial work group environment in future interventions studies. Besides our measure of shared participation, we can imagine further work group level variables, such as a measure for the shared awareness of the topic of stress, work group size, cohesion or climate, etc., which would certainly advance the field of occupational health psychology in understanding how OSE can be fostered through interventions.

**Conclusion and Implications**

Our study contributes to current knowledge by showing evidence for the variability of OSE through occupational stress management interventions in a heterogeneous sample with employees from various occupations and sectors. Furthermore, as suggested by Rigotti and colleagues (2008), we can recommend the use of OSE as an evaluation criterion in the context of broad organizational intervention projects.

The findings further support Semmer's plea for subgroup analyses (Semmer, 2006). Our overall effectiveness analyses with the whole sample would have found no effect of the intervention on change in OSE. But more in-depth subgroup analyses allowed us to make a differentiated conclusion about the variability of OSE through individual participation and work group reach in stress management interventions, and furthermore, its dependence on pre-intervention levels of OSE.

Our study has practical implications not only for organizations interested in implementing stress management interventions but also for occupational health consultants. OSE is an important personal resource in the face of the increasing and challenging demands of today's fast-changing work environment. Employees with high occupational efficacy beliefs perceive job demands as less stressful and more challenging, and other personal and job resources as abundant, cope more problem-oriented, resulting in less job-related stress and enhanced work engagement and performance (Cifre, et al., 2011; Salanova, et al., 2006). Strengthening OSE is thus a worthwhile and reasonable aim of occupational health interventions. Our findings recommend SMC as a short and relatively low-cost intervention – appropriate in heterogeneous occupational contexts – for enhancing OSE. The key point is that a majority of work group members must be engaged in courses to obtain this benefit.

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Table 1

*Overview of the stress management courses' (SMC) main elements and mechanisms for addressing the sources of OSE*

| **Elements of the SMC** | **Addressed sources of OSE** (cf. Bandura, 1977) | **Mechanisms of participation in SMC influencing OSE sources** |
|---|---|---|
| Knowledge transfer about the topic *stress*: causes (demands and resources), stress reaction, health effects;<br>development of motivation and measures to change one's main *stressors; commitment to* enacting changes at work | Enactive mastery experience | Learning how stress develops and affects health; planning transfer of self-developed measures for stress reduction into work life. This motivates and facilitates mastery experience of challenging work situations |
| Knowledge transfer about the topic *resources*: salutogenesis, job and personal resources, coping;<br>developing motivation and measures to enhance main individual *resources; commitment to transfer knowledge to* work life | Enactive mastery experience | Learning about resources' role in addressing challenging work situations; planning transfer of self-developed measures to strengthen resources at work. This facilitates mastery experience of challenging work situations. |
| Knowledge transfer about different *coping* styles and practical exercises (e.g., Jacobson progressive muscle relaxation) | Enactive mastery experience | Learning about adequate coping styles and training opportunities for using them in stressful work situations. This facilitates mastery experience of challenging work situations |
| *Peer consulting session*: learning from each other and defining concrete behavioural strategies for successful implementation of self-developed goals and measures | Enactive mastery experience | Reflection upon participants' mastery experiences and consultation of peers with successful strategies enhances awareness of past enactive mastery |
| | Vicarious experience | Exchanging experiences of mastery of stressful work situations |
| | Verbal persuasion | Consultation of peers and affirmation of each other's ability to transfer knowledge from the course into work life and master challenging work situations |
| Motivating and planning *transfer* to daily work life (including brainstorming of possible hurdles and ways to overcome these) | Enactive mastery experience | Planning transfer into daily work life, including solutions to possible hurdles for implementing needed changes. This facilitates mastery experience of challenging work situations |
| SMC in *total* | Positive affective states | SMCs offer a protected environment to reflect upon experiences with stress at work and develop measures for prevention and coping, thus enhancing emotional well-being in the face of challenging work situations |

Table 2

*Means, standard deviations, scale reliabilities (Cronbach's ±), and correlations of the study variables at the individual level (N = 545)*

| Variables | *M* | *SD* | ± | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| Individual-level | | | | | | | | | | |
| 1. OSE t1 | 4.43 | 0.81 | .89 | | | | | | | |
| 2. OSE t2 | 4.48 | 0.78 | .89 | .65*** | | | | | | |
| 3. OSE t3 | 4.49 | 0.81 | .90 | .62*** | .62*** | | | | | |
| 4. Age | 38.01 | 10.40 | | .08 | .11* | .07 | | | | |
| 5. Job tenure (months) | 59.97 | 74.39 | | .05 | .12* | .03 | .52*** | | | |
| 6. Education | 3.78 | 1.07 | | .03 | .06 | .04 | -.16*** | -.12** | | |
| 7. Gender[a] | | | | -.09* | -.05 | -.04 | .02 | -.01 | -.22*** | |
| 8. Individual participation in SMC[b] | | | | .03 | .02 | .07 | .12** | .05 | -.03 | .07 |

*Note*. OSE = Occupational self-efficacy; SMC = Stress management courses. Pearson and Spearman-Rho correlation coefficients, and Phi coefficients are reported.
[a]Gender is coded 0 = *male*, 1 = *female*. [b]Individual participation in SMC is coded 0 = *no participation*, 1 = *participation*.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed).

Table 3

*Hierarchical growth model regressing OSE on time, individual participation in SMC, and their interaction, while controlling for age*

| | Step 1 | | | Step 2 | | |
|---|---|---|---|---|---|---|
| Variable | Coeff. | *SE* | *t* | Coeff. | *SE* | *T* |
| (Intercept) | 4.20 | 0.12 | 36.10*** | 4.20 | 0.12 | 34.75*** |
| Time | 0.03 | 0.02 | 1.98* | 0.02 | 0.02 | 1.08 |
| Age | 0.01 | 0.00 | 2.13* | 0.01 | 0.00 | 2.16* |
| IPSMC[a] | | | | 0.00 | 0.07 | 0.05 |
| Time x IPSMC | | | | 0.03 | 0.03 | 0.85 |
| AIC | 3111.81 | | | 2854.30 | | |
| BIC | 3165.10 | | | 2917.27 | | |
| -2*logLikelihood | 3091.81 | | | 2830.30 | | |
| Pseudo-$R^2$ with Nagelkerke adjustment | .35 | | | .49 | | |

*Note*. OSE = Occupational self-efficacy; SMC = Stress management courses; IPSMC = Individual participation in SMC; AIC = Akaike information criterion; BIC = Bayesian information criterion; -2*logLikelihood = deviance. AIC, BIC, -2*logLikelihood: Smaller values indicate a better model fit.
[a]Individual participation in SMC is coded 0 = *no participation in SMC*, 1 = *participation in SMC*.
*$p < .05$; ***$p < .001$ (two-tailed).

Table 4

*Hierarchical growth models for the subsamples of low and high shared participation in SMC, regressing OSE on time, individual participation in SMC, and their interaction*

| | Subsample: low shared participation | | | | | | Subsample: high shared participation | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Step 1 | | | Step 2 | | | Step 1 | | | Step 2 | | |
| Variable | Coeff. | *SE* | *t* | Coeff. | *SE* | *t* | Coeff. | *SE* | *t* | Coeff. | *SE* | *t* |
| (Intercept) | 3.63 | 0.23 | 16.01*** | 3.64 | 0.24 | 15.17*** | 4.48 | 0.28 | 16.03*** | 4.39 | 0.29 | 15.01*** |
| Time | 0.03 | 0.02 | 1.53 | 0.04 | 0.03 | 1.52 | 0.03 | 0.03 | 1.26 | -0.04 | 0.05 | -0.77 |
| Age | 0.01 | 0.00 | 3.43*** | 0.01 | 0.00 | 3.35*** | -0.00 | 0.00 | -0.55 | -0.00 | 0.00 | -0.14 |
| Education | 0.08 | 0.04 | 1.98* | 0.07 | 0.04 | 1.85 | 0.03 | 0.04 | 0.66 | 0.06 | 0.05 | 1.22 |
| IPSMC[a] | | | | 0.06 | 0.12 | 0.46 | | | | -0.11 | 0.13 | -0.87 |
| Time x IPSMC | | | | -0.02 | 0.06 | -0.31 | | | | 0.10 | 0.06 | 1.71[†] |
| AIC | 1881.09 | | | 1700.51 | | | 1250.98 | | | 1181.59 | | |
| BIC | 1934.05 | | | 1761.84 | | | 1299.38 | | | 1237.97 | | |
| -2*logLikelihood | 1859.09 | | | 1674.51 | | | 1228.98 | | | 1155.59 | | |
| Pseudo-$R^2$ with Nagelkerke adjustment | .37 | | | .53 | | | .34 | | | .45 | | |

*Note*. OSE = Occupational self-efficacy; SMC = Stress management courses; IPSMC = Individual participation in SMC; AIC = Akaike information criterion; BIC = Bayesian information criterion; -2*logLikelihood = deviance. AIC, BIC, -2*logLikelihood: Smaller values indicate a better model fit.
[a]Individual participation in SMC is coded 0 = *no participation in SMC*, 1 = *participation in SMC*.
*$p < .05$, two-tailed. ***$p < .001$, two-tailed. [†]$p < .05$, one-tailed.

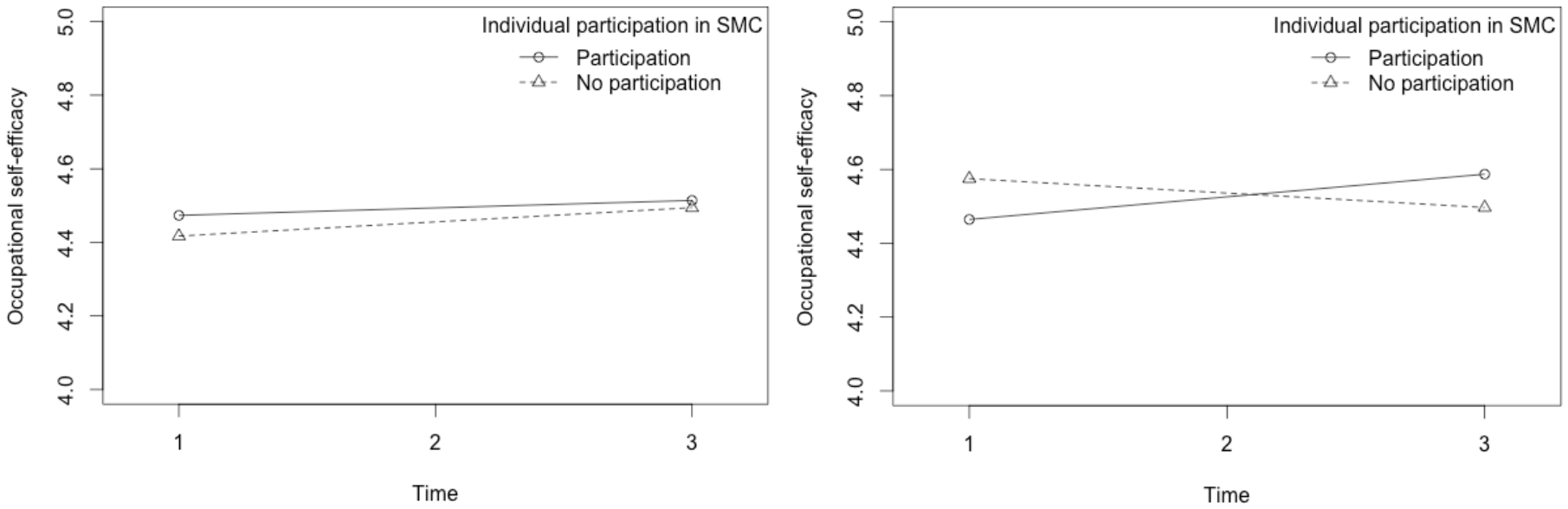


*Figure 1*. Change in OSE over time as a function of individual participation in stress management courses (SMC). No interaction for the subsample of low shared participation (left side); significant interaction for the subsample of high shared participation (right side).